



## SEQUENCE LISTING

<110> SKIADOPOULOS, MARIO H.  
MURPHY, BRIAN R.  
COLLINS, PETER L.

<120> RECOVERY OF RECOMBINANT HUMAN PARAINFLUENZA VIRUS TYPE  
2 (HPIV2) FROM cDNA AND USE OF RECOMBINANT HPIV2 IN  
IMMUNOGENIC COMPOSITIONS AND AS VECTORS TO ELICIT  
IMMUNE RESPONSES AGAINST PIV AND OTHER HUMAN PATHOGENS

<130> 2303-44-3

<140> 10/667,141

<141> 2003-09-18

<150> 60/412,053

<151> 2002-09-18

<160> 70

<170> PatentIn Ver. 3.2

<210> 1

<211> 40

<212> PRT

<213> Human parainfluenza virus 2

<400> 1

Ala Glu Ile Ser Tyr Glu Tyr Thr Leu Lys His Trp Lys Glu Ile Ser  
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Leu Ile Glu Phe Arg Lys Cys Phe Asp Phe Asp Pro Gly Glu Glu Leu  
20 25 30

Ser Ile Phe Met Lys Asp Lys Ala  
35 40

<210> 2

<211> 40

<212> PRT

<213> Human parainfluenza virus 3

<400> 2

Ser Ala Ile Ser Tyr Glu Asn Ala Val Asp Tyr Tyr Gln Ser Phe Ile  
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Gly Ile Lys Phe Asn Lys Phe Ile Glu Pro Gln Leu Asp Glu Asp Leu  
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Thr Ile Tyr Met Lys Asp Lys Ala  
35 40

<210> 3  
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 <213> Human parainfluenza virus 1

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 Thr Ile Tyr Met Lys Asp Lys Ala  
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<210> 4  
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<210> 6  
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 Cys Phe Val Arg Asn  
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<210> 7  
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Pro Tyr Ser Leu Asn  
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<210> 8  
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Pro Tyr Ser Cys Asn  
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Pro Tyr Ser Cys Asn  
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<210> 10  
 <211> 21  
 <212> PRT  
 <213> Human parainfluenza virus 2

<400> 10  
 Asp Ile Ile Thr Pro Ile His Ala Pro Tyr Leu Ala Ser Leu Asp Tyr  
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Val Lys Leu Ser Ile  
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<210> 11  
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 <212> PRT  
 <213> Human parainfluenza virus 3

<400> 11  
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 Ile Lys Leu Ala Leu  
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<210> 12  
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 <212> PRT  
 <213> Human parainfluenza virus 1

<400> 12  
 Gly Val Val Glu Pro Val Tyr Gly Pro Asn Leu Ser Asn Gln Asp Lys  
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 Ile Leu Leu Ala Ile  
                   20

<210> 13  
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 <212> PRT  
 <213> Human parainfluenza virus 2

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<210> 14  
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 <212> PRT  
 <213> Human parainfluenza virus 3

<400> 14  
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<210> 15  
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 <212> PRT  
 <213> Human parainfluenza virus 3

<400> 15  
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<210> 16  
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<400> 16  
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<220>  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<210> 19  
 <211> 56  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 19  
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<210> 20  
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<212> DNA  
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<220>  
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<211> 49  
<212> DNA  
<213> Human parainfluenza virus 2

<400> 21  
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<210> 22  
<211> 50  
<212> DNA  
<213> Human parainfluenza virus 2

<400> 22  
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<210> 23  
<211> 47  
<212> DNA  
<213> Human parainfluenza virus 2

<400> 23  
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<210> 24  
<211> 50  
<212> DNA  
<213> Human parainfluenza virus 2

<400> 24  
atgactgctc ctgatcaacc accagtatca gtagcaaagc ggatggctaa 50

<210> 25  
<211> 49  
<212> DNA  
<213> Human parainfluenza virus 2

<400> 25  
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<210> 26  
 <211> 49  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 26  
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<210> 27  
 <211> 49  
 <212> DNA  
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<400> 27  
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<210> 28  
 <211> 50  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 28  
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<210> 29  
 <211> 50  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 29  
 ttgatttcaa tggatgaact agctagacct acactctcat caacaaaaag 50

<210> 30  
 <211> 49  
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<400> 30  
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<210> 31  
 <211> 49  
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 <213> Human parainfluenza virus 2

<400> 31  
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<210> 32  
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 <212> DNA  
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<400> 32  
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<210> 33  
 <211> 47  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 33  
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<210> 34  
 <211> 50  
 <212> DNA  
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<400> 34  
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<210> 35  
 <211> 47  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 35  
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<210> 36  
 <211> 50  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 36  
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<210> 37  
 <211> 50  
 <212> DNA  
 <213> Human parainfluenza virus 2



<400> 37  
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<210> 38  
 <211> 49  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 38  
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<210> 39  
 <211> 50  
 <212> DNA  
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<400> 39  
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<210> 40  
 <211> 48  
 <212> DNA  
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<400> 40  
 aaactctaac aaagttcgat ttatcccttg acatctttcc acatccag 48

<210> 41  
 <211> 45  
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 <223> Description of Artificial Sequence: Synthetic  
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<400> 41  
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<210> 42  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 42  
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<210> 43  
<211> 43  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 43  
attgagaggg gtatcgatgg cgaagaatta tgacaacagt gat 43

<210> 44  
<211> 44  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 44  
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<210> 45  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 45  
attgagaggg gtatcgatgg cgaagaatta tgacaacagt gataa 45

<210> 46  
<211> 46  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 46  
attgagaggg gtatcgatgg cgaagaatta tgacaacagt gataac 46

<210> 47  
 <211> 47  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 47  
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47

<210> 48  
 <211> 89  
 <212> DNA  
 <213> Artificial Sequence

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<400> 48  
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 aaaatctgat acagcttaac ccactcaac 89

<210> 49  
 <211> 89  
 <212> DNA  
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<220>  
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<220>  
 <221> misc\_feature  
 <222> (46)  
 <223> may or may not be present

<400> 49  
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 cgttttggct gtattagaat gctatagca 89

<210> 50  
 <211> 90  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<220>  
 <221> misc\_feature  
 <222> (75)..(76)  
 <223> may or may not be present

<400> 50  
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 taagattata atatataggc cagaatggcg 90

<210> 51  
 <211> 89  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (33)  
 <223> may or may not be present

<400> 51  
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 ctaagattat aatataggcc agaatggcg 89

<210> 52  
 <211> 89  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (9)  
 <223> may or may not be present

<400> 52  
 ttactaaaag ttattctgat atttaagaaa aaataatctt tatataatgt aacaatacta 60

ctaagattat aatataggcc agaatggcg

89

<210> 53  
 <211> 88  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<220>  
 <221> misc\_feature  
 <222> (43)..(44)  
 <223> may or may not be present

<400> 53  
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 taagattata atataggcca gaatggcg 88

<210> 54  
 <211> 76  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<220>  
 <221> misc\_feature  
 <222> (12)  
 <223> may or may not be present

<220>  
 <221> CDS  
 <222> (10)..(48)

<400> 54  
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 Phe Glu Asp Ile Glu Arg Gly Ile Asp Gly Glu Glu Leu  
 1 5 10

tgacaacagt gattataaga actcatga

76

<210> 55  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

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Phe Glu Asp Ile Glu Arg Gly Ile Asp Gly Glu Glu Leu  
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&lt;210&gt; 56

&lt;211&gt; 75

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic oligonucleotide

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (10)..(72)

&lt;400&gt; 56

attaatgat ttg aag ata tcg aga ggg gta tcg atg gcg aag aat tat gac 51  
 Leu Lys Ile Ser Arg Gly Val Ser Met Ala Lys Asn Tyr Asp  
 1 5 10

aac agt gat tat aag aac tca tga  
 Asn Ser Asp Tyr Lys Asn Ser  
 15 20

75

&lt;210&gt; 57

&lt;211&gt; 21

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 57

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Asp Tyr Lys Asn Ser  
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<210> 58  
 <211> 15654  
 <212> DNA  
 <213> Human parainfluenza virus 2

<400> 58  
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 caaactagcc atgcattcac cagaagccag catagataga gtagaaataa cagggtttga 480  
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 ccagagccac acaatcatgg ccgaggaacc aacatacacc actgagcaag ttgatgaatt 2040  
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gaaagcttgc	ctttcagaca	gatcccaaaa	tcatagtcca	aacttcaaac	acagcagcag	3480
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